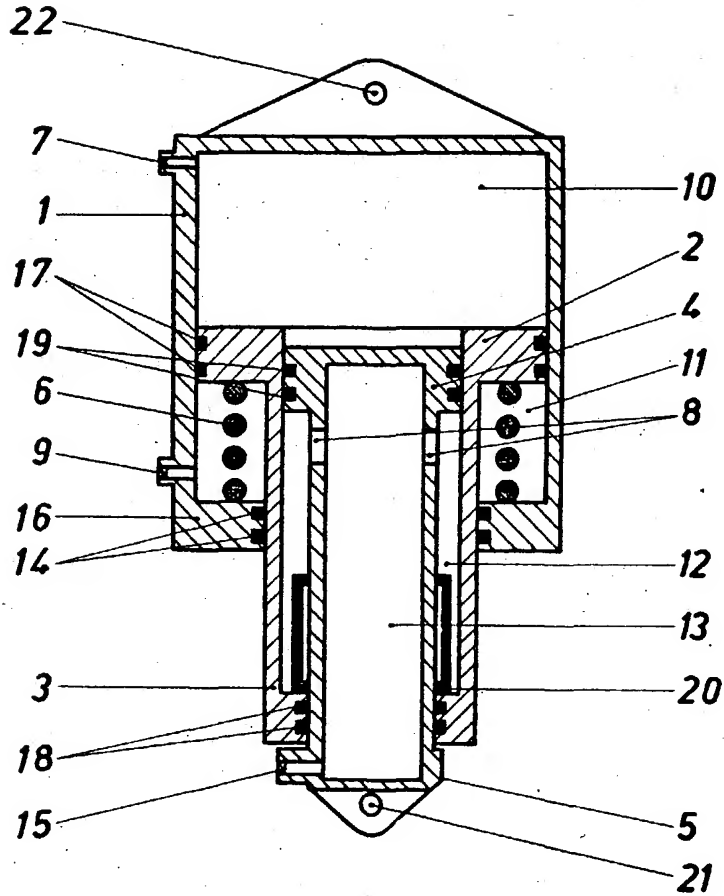


SEP 1962

67  
906848  
1 SHEET

COMPLETE SPECIFICATION

This drawing is a reproduction of  
the Original on a reduced scale



# PATENT SPECIFICATION

DRAWINGS ATTACHED

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POSSELT

906.848



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cl. 244

## COMPLETE SPECIFICATION

### A Shock Absorbing Strut

We, VEB FLUGZEUGWERKE DRESDEN, a nationalised Corporation organised and existing under the laws of Eastern Germany, of Königsbrucker Landstrasse, Dresden, N. 2, Eastern Germany, do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to a shock-absorbing strut, particularly for aircraft landing gear, which is adapted simultaneously to perform several functions.

It is known that for raising and lowering aircraft landing gear mechanically or hydraulically operable struts in conjunction with radius rods are employed, which perform a definite function, whereas special struts or mechanisms are used for the absorption of shock. The braking action is initiated by automatic braking devices which prevent the wheels from locking during the braking operation but which do not suppress landing gear flutter.

In the case of landing gear which for the purpose of decreasing the wheel load or for some other reason comprises more than two wheels mounted in forks of a balancing beam pivoting on an axis across the direction of travel, several shock-absorbing struts are required for ensuring the necessary positional stability of the gear.

In multiwheel landing gear it is known that the longitudinal axis of the wheel carriage must be inclined at a given angle to the runway at touchdown. On the other hand, the position of the retracted wheel carriage depends upon the nature of the available space. The position of the wheel carriage when riding over obstructions, such as undulations in the runway across the track of the aircraft must be such that the shock is absorbed by tilting deflections without producing landing gear flutter. Moreover, for absorbing the braking forces and for

safeguarding the tyres it is important that the differential loads which are due to the braking torque should be uniformly or substantially uniformly distributed between the several wheels.

In forms of construction hitherto known these functions were undertaken by more or less complex and expensive as well as heavy hydraulic or pneumatic systems.

It is therefore desirable to provide a shock-absorbing strut which incorporates means for the suppression of flutter, means for compensating the braking torque, and means for retaining a selected angle of incidence in a tandem type landing gear during touchdown and approach, whilst at the same time occupying a minimum of space when the landing gear is retracted, being structurally as simple as possible and permitting peak loads to be yieldingly taken up.

The invention solves this problem by providing a shock-absorbing strut which comprises a principal piston in a closed cylinder with a principal piston rod projecting from the said cylinder, said principal piston rod dividing the cylinder into a principal chamber and an annular chamber formed by the principal piston, the principal chamber extending into the interior of the principal piston and of its piston rod. The interior of the principal piston and of its piston rod contains a supplementary piston with a supplementary piston rod, located between the principal cylinder chamber which is filled with a gaseous medium and an inner annular chamber likewise filled with a gaseous medium and formed by the presence of the supplementary piston. The end of the supplementary piston rod projects from the principal piston rod and is provided with an abutment. Inside the annular chamber which has a connection for communication with the hydraulic brake system is a compression spring for supporting the principal pis-

[Price 4s. 6d.]

- principal piston and of the principal piston rod contains a supplementary piston with a supplementary piston rod located between the principal cylinder chamber which is filled with a gaseous medium and an inner annular chamber also filled with a gaseous medium and formed by the presence of the supplementary piston, that the end of the supplementary piston rod projecting from the principal piston rod is formed with an abutment and that the annular chamber which has a connection for communication with the hydraulic braking system contains a compression spring for supporting the principal piston.
- 5 2. A shock-absorbing strut according to Claim 1, characterised in that the pressure in the inner annular chamber exceeds the maximum pressure in the principal chamber, whereas the thrust generated by the pressure in the inner annular chamber exceeds the thrust due to the bias of a compression spring but is less than the ultimate thrust of said spring when fully compressed.
- 10 3. A shock-absorbing strut according to Claim 1, characterised in that the supplementary piston and the supplementary piston rod enclose a common cavity which permanently communicates through ports with the inner chamber.
- 15 4. A shock-absorbing strut according to Claim 1, characterised in that the abutment contains a filler opening.
- 20 5. A shock-absorbing strut according to Claim 1, characterised in that the inner annular chamber contains a limit ring which determines the maximum stroke of the supplementary piston.
- 25 6. A shock - absorbing strut according to Claim 1, characterised in that the connection with the hydraulic brake system contains a non-return throttle valve.
- 30 7. A shock - absorbing strut substantially as described and illustrated herein with reference to the accompanying drawing.
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